

Remarks/Arguments

Applicant wishes to thank the Examiner for the interview on May 8, 2007. During the interview, the claims and the references of record were discussed and various claim limitations that would overcome the stated rejections.

In paragraphs 4 and 9 of the Office Action, the Examiner noted that the application names joint inventors. Applicant respectfully points out that the application does not name joint inventors and that Paul J. Wyser is the **sole inventor**.

In paragraph 5 of the Office Action, the Examiner has rejected claims 1-3 under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Robertson 4,040,938. For the reasons discussed below, and in view of the claims as now presented, Applicant respectfully submits that claims 1-3 are not anticipated by or obvious in view of Robinson.

Robertson discloses an electrode arrangement for electrochemical cells. A deformable sandwich structure (working electrode, insulator, secondary electrode, and insulator) forms a primary electrode arrangement. A three-dimensional structure can be formed by rolling up the primary sandwich structure around an axis. The shapes and material structures of electrodes and insulators co-operate with each other to enable axial and/or radial flow of an electrolyte which is pumped through the electrode roll. With such electrode rolls a high ratio of electrode surface to cell volume can be attained. Furthermore, by mounting one or more of the electrode rolls on a hollow axle and pumping the electrolyte through orifices of the axle from its interior into the electrode rolls, the scale-up of current and voltage of a cell is considerably facilitated and advantageously achieved.

Note that the battery of Robertson includes a connection bolt 37 that is not coupled to any housing of the battery. Note also, that the electrode 31 extends the entire longitudinal axis of the battery and is secured at its other end by a screw as illustrated in Fig. 8.

In contrast, note that Applicant's independent claim 1 has been further amended to recite a screw connection formed between the at least one first contact connection and the pin. The claim recites that the screw connection comprises a screw and the at least one pin that is held at only one end by the screw that is screwed into a cavity of the pin. Robertson fails to disclose these elements or the other combination of elements as recited in Applicant's claim 1 and, therefore, Applicant believes that claims 1-3 are not unpatentable over Robertson.

Applicant respectfully directs the Examiner's attention to the elements of claim 1 that contribute to a very compact design of the battery. It is one of the main aspects of the invention that the "holding", "supporting" and "conducting" functions may be realized by a single element (i.e., the "pin"). None of the prior art, when viewed alone or in combination, disclose this combination.

Note that Robertson clearly does not disclose a pin that is held by screw connection. One of the screws (connection bold 37) disclosed by Robertson does not have any function for holding the pin, but appears to serve only as an electrical contact; the other screw (no reference number) is not formed between a contact connection and the pin and does not hold the pin at the housing. Furthermore, the pin is not held at only one end, in contrast it is mainly held by a tight press fit of the cathode sheet of the electrode roll with the housing (col. 5, 1. 49-52), furthermore a disc (36) at one end as well as a PVC cover (35) at the other end are provided. Thus, holding elements are present at both ends of the pin.

In contrast, the Applicant respectfully points out that the language of claim 1 now requires that the at least one pin is held by a screw connection and held at one end as opposed to being held at both ends as required by Robertson. Indeed it would appear that if the Robertson pin was not held at both ends, the device would not function as intended. Therefore, the reference actually teaches away from holding a pin at only one end as now claimed.

In paragraph 7 of the Office Action, the Examiner rejected (at least) claim 1 under 35 U.S.C. 102(b) as being anticipated by Nagaura 5,958,620. In view of the claim as now presented, and for reasons discussed above and also for the following reasons, Applicant believes claim 1 is not anticipated by Nagaura.

Nagaura discloses a method which allows a battery with a flat base to be produced in a cylindrical battery manufacturing method in which a metallic casing with a larger outside diameter than the outside diameter of the metallic casing in the finished battery is used, a battery element is housed in the said metallic casing, then the outside diameter of the metallic casing reduced; to reduce the occurrence of defective batteries due to deficient electric conduction between the metallic casing and the electrode lead; and to improve the safety of the said cylindrical battery in the event of an outside short circuit. In the making of a battery in which the outside diameter of the metallic casing in the finished battery is A, the outside diameter of the metallic casing used is made to satisfy the relationship $L2 > A \cdot \text{gtoreq} \cdot L3$. The battery element, made by winding in a coil shape, is wound so that when winding is completed the end of electrode or electrode current collector of either the negative electrode or the positive electrode is positioned at the outermost periphery of the battery element, then the said battery element is housed in a cylindrical metallic casing, after which the outside diameter of the said metallic casing is reduced to strengthen the contact between the end of electrode or electrode current collector positioned at the outermost periphery of the battery element and the internal wall of the metallic casing, and make the electric resistance of contact between the electrode and metallic casing sufficiently small.

Again, Applicant's claim 1 requires a pin that is held at the housing at only one end by a screw connection, and the screw is screwed into a cavity of the at least one pin. This is not shown by Nagaura.

For all of the foregoing reasons and in view of the claim as now presented, Applicant respectfully submits that claim 1 is not anticipated by Nagaura.

In paragraph 9 of the Office Action, the Examiner rejected claims 1-11 and 13-15 as being unpatentable over Souliac et al. 6,399,237 in view of Nagaura and further in view of EP 1100138. In view of the claim 1 as now presented and for the reasons described above, and also for the following reasons, Applicant respectfully submits that claims 1-11 and 13-15 are not unpatentable over Souliac in view of Nagaura.

Souliac discloses a cylindrical high-capacity sealed storage cell having a terminal at one end which is made of aluminum, wherein: the one end includes an aluminum cover adapted to be brought into contact with an external electrical connecting part by a clamping structure which is at least in part under the cover and co-operates with an external assembly mechanism, the clamping structure being made from a material selected from the group consisting of stainless steel, nickel-plated steel, copper, and brass; and the cover of the cell is sealed by a metal sealing cap under the cover.

Souliac et al. states that "the electrochemical stack 9...is generally wound in a spiral about an X axis on a central support 19." (Col. 3, l. 59-62). Furthermore, the support 19 is either made from an insulative material, or if not insulative itself, then is insulated from the electrodes by an insulative material of the same type as the separator. (Col. 3, l. 63-67). Thus, Souliac et al. appears to teach of a battery with an electrode element which is wound around an insulated supporting element. This is contrary to Applicant's claimed battery.

In Applicant's claim 1, the claim has been amended to recite:

"A battery ~~with an energy capacity of 1 Ah or less~~ having in a housing at least one wound electrode element, the electrode of which being supported on a metallic supporting strip, and having inside said housing at least one pin for making contact with said at least one wound electrode element, and having at least one first contact connection which is fitted to an outer face of the housing and is electrically connected to said at least one pin which is arranged in the housing, ~~whereas~~ wherein a second screw connection ~~which can be tightened mechanically~~ is formed between

said at least one first contact connection and said at least one pin, whereas said at least one wound electrode element is wound directly around and directly supported by said at least one pin and said metallic supporting strip of said at least one wound electrode element is welded directly to said at least one pin, ~~wherein a maximum amount of charge that said battery can hold is less than 1 Ah~~ wherein said second screw connection comprises a screw, said at least one pin being held at only one end to the housing by said screw after said screw is screwed into a cavity of said at least one pin."

Applicant can find no teaching in Souliac et al. that suggests that the electrode be wound around a pin or that a pin with a cavity be connected to the housing by a screw. Even assuming arguendo that the Souliac et al. insulator is a pin, which Applicant believes it is not, the insulator is not conductive and, therefore, cannot teach of or even perform the multiple functions mentioned earlier, such as the element that Applicant's pin is conductive as is recited in claim 1.

In paragraph 10 of the Office Action, the Examiner states that the electrodes of Souliac et al.'s invention are indirectly connected to connecting part 29 via blades 24 (See Fig. 1 of Souliac et al.). The Examiner concludes that connecting part 29, serving as the Applicant's pin as interpreted by the Examiner, indirectly provides mechanical support to the wound electrode assembly.

Applicant respectfully points out the language of claim 1 that requires, "wound electrode element is wound around and supported by said at least one pin and...welded directly to said at least one pin." Thus, not only is the electrode element specifically required to be wound around the pin, but claim 1 requires that it be directly welded to the pin. One advantage of a direct weld is that it provides direct mechanical support and electrical connection, which is not provided in Souliac et al.

Moreover, Souliac does not disclose a pin that is, at the same time, held at the housing at only one of its ends and that does support the wound electrode element. Instead, there is a central support 19 for supporting the electrode as well as a connecting part 29 that is held at the housing (which does not directly support the electrode). Furthermore, the metallic supporting strip of the electrode element is not welded directly to the pin.

Applicant again respectfully points out the claim 1 has now been amended to recite that the pin is held at only one end of the housing by the screw connection that is screwed into a cavity of the pin. Note also that the claim 1 further recites that the electrode is wound directly around and is directly supported by the at least one pin. Souliac, whether viewed alone or in combination with Nagaura, fails to disclose this feature.

Even assuming *arguendo* that it were obvious to combine the references as suggested by the Examiner, the resultant combination would still fail to teach of these limitations relative to Nagaura and Souliac.

For all of the foregoing reasons and view of the claims as now presented, Applicant believes that claim 1 is not unpatentable over Souliac et al. in view of Nagaura.

Claims 2-11 and 13-15 are dependent claims and depend either directly or indirectly from claim 1 and contain additional limitations. Therefore, it is believed these claims are also patentable for the reasons stated above.

In paragraph 11 of the Office Action, the Examiner rejected claim 21 under 35 U.S.C. 103(a) as being unpatentable over Souliac et al. in view of Nagaura, and further in view of the EP 1100138. In view of the claims as now presented, for the reasons discussed above and also for the following reasons, Applicant believes claim 21 is not unpatentable over Souliac in view of Nagaura and further in view of EP 1100138.

In paragraph eleven of the Office Action, Examiner states that EP '138 comprises a housing (3, 4, 5 of Fig. 1) and pins (13, 14 of Figure 1; 32, 33 of Fig. 5A). As understood, the Examiner interprets the pipes (7, 8 of Fig. 1; 34, 35 of Fig. 5A) as being pins as well. From this point of view, the Examiner interprets the shown pipes (34, 35 in Fig. 5A) as the claimed pins, while the disclosed pins (13, 14 of Fig. 1 or 32, 33 of Fig. 5A) are taken to represent the second connection which can be tightened mechanically.

Applicant respectfully believes that this interpretation is inconsistent with the actual construction of the battery in EP '138. With respect to Fig. 1 of EP '138, the pins that the Examiner believes represents the second connection are believed to be square pins that are soldered to the circuit board. Applicant notes that the German text of EP '138 reads "In der Schaltungsplatine 2 sind zwei Vierkantstifte 13, 14 eingelötet" which translates to "two square pins, 13, 14 are soldered to the circuit board 2." (Col. 6, l. 16-17).

With respect to Fig. 5, the German text of EP '138 reads "Die Batterie 30 ist wiederum auf einer Schaltungsplatine 31 aufgesteckt, welche zwei Vierkantstifte 32, 33 aufweist." (Col. 7, l. 7-9). This is to be translated as: "The battery 30 is plugged onto a circuit board 31, which features two square pins 32, 33." Thus, the pins 13, 14 of EP '138 do not appear to be part of the battery, but solely connection elements soldered to the circuit board.

Moreover, Applicant respectfully points out that reference numeral 12 of Fig. 1 of EP '138 is a tubular rivet and is therefore unable to be mechanically tightened as well.

In contrast, Applicant's claims, such as claim 1, each require that the second connection can be mechanically tightened. Accordingly, Applicant believes that independent claim 1 is not anticipated by EP '138 and should be allowed.

Claim 21 depends directly from claim 1. For the reasons discussed earlier relative to the rejection of claim 1, it is respectfully submitted that this claim is also in condition for allowance and such allowance is respectfully requested.

Applicant also respectfully submits that even assuming arguendo, a teaching to combine the references as the Examiner seems to suggest, the resultant combination would fail to teach of Applicant's embodiment claimed in claim 1 and in the dependent claim 21 because the references would fail to teach of at least one pin having a cavity that receives the screw and that is connected to the housing at one end. There is no teaching in any of the references, either when viewed alone or in combination that suggest such features.

For the reasons discussed below, Applicant believes the claims are not anticipated by the references cited by the Examiner and respectfully traverses the rejections.

There is no suggestion in the prior art to selectively combine isolated features of the different references cited. Furthermore, scrutinizing the references one notices that none of these references discloses a pin for directly supporting the wound electrode element, or a pin, held at only one end of the housing by a screw of a screw connection that is screwed into a cavity of the pin.

Moreover, Applicant respectfully points out that reference numeral 12 of Fig. 1 of EP '138 is a tubular rivet and is therefore unable to be mechanically tightened as well.

FOR ALL THE FOREGOING REASONS, APPLICANT BELIEVES THIS CASE IS NOW IN CONDITION FOR ALLOWANCE. IF THE EXAMINER FEELS THAT THIS AMENDMENT DOES NOT PLACE THE CASE IN CONDITION FOR ALLOWANCE, THEN APPLICANT RESPECTFULLY REQUESTS AN INTERVIEW WITH THE EXAMINER.

The Commissioner is hereby authorized to charge any additional fees under 37 C.F.R. 1.16 and 1.17 which may be required by this paper, or to credit any overpayment, to Deposit Account No. 50-1287.

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Group: 1745

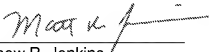
Applicant hereby provides a general request for any extension of time which may be required at any time during the prosecution of the application. The Commissioner is also authorized to charge any fees which have not been previously paid for by check and which are required during the prosecution of this application to Deposit Account No. 50-1287. (Should Deposit Account No. 50-1287 be deficient, please charge any further deficiencies to Deposit Account No. 10-0220).

Applicant invites the Examiner to contact the undersigned via telephone with any questions or comments regarding this case.

Reconsideration and favorable action are respectfully requested.

Respectfully submitted,

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